"Nomophobia": Impact of Cell Phone Use Interfering with Symptoms and Emotions of Individuals with Panic Disorder Compared with a Control Group

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Abstract: Panic disorder refers to the frequent and recurring acute attacks of anxiety. *Objective:* This study describes the routine use of mobiles phones (MPs) and investigates the appearance of possible emotional alterations or symptoms related to their use in patients with panic disorder (PD). *Background:* We compared patients with PD and agoraphobia being treated at the Panic and Respiration Laboratory of The Institute of Psychiatry, Federal University of Rio de Janeiro, Brazil, to a control group of healthy volunteers. *Method:* An MP-use questionnaire was administered to a consecutive sample of 50 patients and 70 controls. *Results:* People with PD showed significant increases in anxiety, tachycardia, respiratory alterations, trembling, perspiration, panic, fear and depression related to the lack of an MP compared to the control group. *Conclusions:* Both groups exhibited dependence on and were comforted by having an MP; however, people with PD and agoraphobia showed significantly more emotional alterations as well as intense physical and psychological symptoms when they were apart from or unable to use an MP compared to healthy volunteers.

Keywords: Anxiety, dependence, nomophobia, panic.

1. INTRODUCTION

The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) [1] includes panic disorder (PD) with agoraphobia among its list of anxiety disorders. This disorder is characterized by frequent, recurrent and acute attacks of anxiety. Panic attacks are described as a period of intense fear or anxiety accompanied by somatic and psychological symptoms. These symptoms include a lack of breath, tachycardia, fainting, perspiration and trembling. Agoraphobia [2] is associated with psychological anxieties including a fear of losing control, fainting, dying, being in crowded areas, travel, and feeling ill in public places.

"Nomophobia" [3] is the modern fear of being unable to communicate through a mobile phone (MP) or the Internet. The word "nomophobia" originated in England and is derived from the expression "No Mobile Phobia", that is, the phobia of being without an MP. Nomophobia [4] is a term that refers to a collection of behaviors or symptoms related to MP use. Nomophobia is a situational phobia related to agoraphobia and includes the fear of becoming ill and not receiving immediate assistance.

Because people's relationships with MPs, computers and other technology profoundly influence interpersonal behaviors and social habits, these relationships should be continuously monitored and studied [5].

Communication technologies modify people's interaction with the world, their perception of reality and their interactions with time and space [6]. MPs facilitate individual communication processes and provide a degree of mobility that allows their users to be reached at any time. Moreover, MPs allow people to connect with others wirelessly and without a physical local network. The miniaturization of communication technologies permits an extensive amount of flexibility, mobility and personalization [5].

These portable technologies express the values of freedom of choice, will and action and ultimately emphasize individuals over collectives. Technological evolutions are currently facing powerful, instinctive and primitive forces to which humans. MPs are attractive because they allow users to browse the Internet, work with people from a distance, speak with friends and colleagues, resolve problems and render services without leaving their current location. Because new technology facilitates each of these functions, it leads to the widespread acceptance of and excitement about these devices [7].

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The literature [8] reveals that, due to the specific characteristics of their disease, patients with PD are more anxious and worried about various daily issues than healthy people. People with agoraphobia [2] fear public places and the inability to receive immediate aid may be responsible for developing an excessive attachment to an MP among this particular population. In these cases, an MP makes people with anxiety disorders [9] feel more secure as an MP allows them to be rescued from an attack. Healthy people also depend on MPs for work and socializing; however, they do not despair or become nervous when they are unable to make a call or connect to the Internet.

Based on the characteristics of anxiety disorders [9], we began to observe that people with this condition are dependent upon certain types of technologies, including MPs [10]. Specifically, the absence of these devices cause distress and anxiety in individuals with anxiety disorders.

The present study hypothesized that people with PD and agoraphobia would show more emotional alterations and symptoms related to the absence of their MPs than would healthy people. The MP may have a potential role as a safety signal for agoraphobic PD patients. The importance of safety signals and safety-seeking behavior in those with anxiety disorders in general, and PD with agoraphobia specifically, is a topic receiving considerable attention in the cognitive behavioral literature [11].

This study describes the participants' routine use of MPs and examines the possible appearance of emotional alterations and symptoms related to the daily use (or lack thereof) of the MP. Participants included a group of patients with PD and agoraphobia and a control group consisting of people without any psychiatric disorders.

2. MATERIALS AND METHODS

This quantitative and descriptive study employed a consecutive sample of volunteers consisting of 50 patients with PD with agoraphobia and 70 control volunteers with no psychiatric disorders. Psychiatrists at the Laboratory of Panic and Respiration (LABPR) of the Institute of Psychiatry (IPUB) within the Federal University of Rio de Janeiro (UFRJ) diagnosed the patients according to the diagnostic criteria of DSM-IV-TR [1], and a complementary clinical evaluation tool, the Mini International Neuropsychiatric Interview (MINI) version 5.0.0 [12], evaluated psychiatric disorders.

We divided the volunteers into two groups. Group 1 consisted of patients with PD with agoraphobia, and Group 2 was made up of the 70 control participants. We recruited all members of the later group from the staff and students of the Institute of Psychiatry and non-family caregivers of the patients. All participants met the criteria for inclusion in the research. The control group was heterogeneous with regard to age, education, occupation and sex. The control participants underwent psychiatric evaluations and completed the MINI to rule out the presence of mental disorders.

The criteria for inclusion in the control group consisted of being between 18- and 70-years of age, literate, residents of Rio de Janeiro and MP owners. The criteria for exclusion consisted of having a psychiatric disorder or serious clinical comorbidity.

All volunteers signed a "Terms of Free and Clarified Consent" form and attended to instructions regarding the study's procedures. The Committee of Ethics for Research of the IPUB/UFRJ approved this study.

To assess participant nomophobia, we conducted an extensive literature search for a tool that provides good psychometrics (i.e., validity and reliability parameters) for studies conducted in Brazil. We did not find such an instrument nor could we find a nomophobia measure validated for other cultures. Thus, we opted to use a structured questionnaire that our research group developed.

An extensive review of nomophobia raised major issues that permeated the relationship between people and their MPs, as well as their reactions arising from the loss of their MPs. These questions were based on the nomophobia literature as well as sociodemographic data, MP routines, dependence upon MPs, and the possible symptoms and emotions related to the daily use of MPs (or lack thereof).

Two psychiatrists initially created the questionnaire, which was then sent to two other clinicians who acted as judges and offered suggestions for its improvement. The creators discussed all suggestions with a third psychiatrist who was naïve to the instrument. A consensus decided that 29 questions were adequate to address nomophobia.

A pilot study consisting of seven patients (who were not part of the group of study patients) with varying levels of education completed the questionnaire to determine whether the questionnaire was comprehensible. The patients and the data from the pilot study were not considered in the full study. These participants had no difficulty in understanding and completing the questionnaire.

Thus, we prepared the 29-item, self-report, objective response questionnaire concerning MP use as an evaluation instrument (Table **1**). We present the participant demographic data in Tables **2** and **3** using percentages. We report age as the means and standard deviations. The chi-squared test with a 95% confidence interval and a p-value ≤ 0.05 detected statistically significant differences between the groups with respect to the nonparametric variables. The total error approximation for the questionnaire exceeded 5. Considering the large number of variables analyzed, the Bonferroni correction was applied, and the nominal significance level was determined to be p = 0.002.

To study participant-expressed symptoms and emotions and to understand the contribution and weight of each variable in separating the group, we used the multivariate method of canonical correlation analysis for dichotomous variables.

3. RESULTS

Socio-demographic data indicated that the average age of Group 1 participants was 43 years and the average age of individuals in Group 2 was 35 years; the percentages of females and males in Group 1 were 76% and 24%, respectively, and 68% and 31%, respectively, in Group 2. In both groups, the level of schooling of individuals ranged from primary to university, and 99% of all participants were employed. There were no important differences between the groups. Table **2** describes participants' routine MP use.

Table 1.   Mobile Phone Use Questionnaire (MP-Use Questionnaire).

Name: Age: Sex:
Educational Level: Occupation: Date:
(Mark correct answers with an X)
1 - How long have you have a mobile phone (MP)?
A- Less than 1 year; B- 1 to 2 years; C- 3 to 4 years; D- More than 4 years
2-Do you routinely use an MP all day? YES/NO
3 - Can you leave home without taking your MP? YES/NO
4-When you forget your MP, do you come back for it? YES/NO
5 - Do you feel anxious when you forget your MP? A- No; B-Yes, between 10% and 30%; C-Yes, between 30% and 50%; D-Yes, between 50% and 70%; E-Yes, between 70% and 90%; F-Yes, 100% anxious
6 - How far can you travel from your home without an MP? A- 500 m; B- 1 km; C-More than 1 km
7 – Do you make more than three calls per day? YES/NO
8- Do you receive more than three calls per day? YES/NO
9 - Do you often feel rejected when no one calls you? YES/NO
10 - Do you feel low self-esteem when you see that your friend has received more calls than you? YES/NO
11 - Do you like to be found at any time? YES/NO
12 – Do you turn off your MP in restaurants or in the company of another person? YES/NO
13 – Do you set your MP to vibrate rather than turning it off? YES/NO
14 – Do you keep your MP on 24 hours a day? YES/NO
15 - Do you sleep with your MP turned on? YES/NO
16- Have you experienced any of the following symptoms or emotions due to not having your MP near? A- Tachycardia; B- Tremors; C- Sweating; D- Changes in respiration; E- Depression; F- Loneliness; G- Rejection; H- Panic
17- Are you afraid of feeling ill in public and not having an MP to call in an emergency? YES/NO
18 - Do you have your doctor's phone number on speed dial? YES/NO
19 - Do you have your hospital's phone number on speed dial? YES/NO
20 - Do you have your psychologist's phone number on speed dial? YES/NO
21 - Before you go to sleep, do you usually call someone to retain his or her phone number in the MP's immediate memory to call if you feel bad? YES/NO
22 - Do you feel comforted by having immediate access to others whenever you want?
YES/NO
23 - Would you lend your MP to a friend for a week? YES/NO
24- How do you feel when your MP has no minutes, battery charge, or is out of range? A- Anxious; B- distressed; C- Agitated; D- Afraid; E- Disoriented
25 – When you have your MP, do you feel monitored 24 hours a day? YES/NO
26 - Do you feel dependent on your MP? YES/NO
27 - Do you feel insecure without your MP? A- NO; B- Yes, between 10% and 30%; C- Yes, between 30% and 50%; D- Yes, between 50% and 70%; E-Yes, between 70% and 90%; F-Yes, 100% insecure
28 – Do you have the feeling of being with someone when you have your MP? YES/NO
29 – Would you feel you had the same freedom of movement if you were without your MP? YES/NO

In general, the symptoms (anxiety, trembling, perspiration, tachycardia, respiratory alterations, depression, panic, fear) or emotions (comfort, agitation, disorientation, dependence, rejection, low self-esteem, loneliness, insecurity) due to not having access to an MP were significantly different between the participants with PD and the control group (χ^2 = 13, 314, df = 1, p < 0.001). Table **3** describes the anxiety and depressive symptoms in subjects across the groups, whereas Table **4** reports the emotions associated with MP use (or lack thereof). We also recorded the participant's current state of mind during the test, and a chi-squared test measured the degree of significance of these differences between groups.

Table 2.   Routine Mobile Phone use.

Routine Mobile Phone (MP) Use	Group 1 Panic Disorder with Agoraphobia	Group 2 Control	χ^2	df	p-value
Uses the MP all day	100%	80%	11.321	1	0.001
Leaves without a MP	48%	43%	0.312	1	0.577
Do you go back home when you forget your cell phone?	50%	45.7%	0.215	1	0.643
you won't go away from home without your MP	56%	70%	2.486	1	0.115
When not keep off the MP in vibrate mode	64%	78%	3.106	1	0.078
Feel comfortable to have immediate access to another	96%	84%	4.143	1	0.042
Makes more than 3 calls / day	40.0 %	71.4 %	11.853	1	0. 001
Receives more than 3 calls / day	48.0 %	80. %	16.474	1	< 0. 001
Likes to be able to be found at any time of the day	62.0 %	55.7 %	0.474	1	0. 491
Keeps the MP switched on 24 hrs	74.0 %	75.7 %	0.046	1	0. 831
Sleeps with the MP switched on	74.0 %	68.6 %	0.416	1	0. 519
Has doctors' telephone numbers in the contact list	48.0 %	44.3 %	12.617	3	0. 006
Has hospitals' telephone numbers in the MP contact list	82.0 %	61.4 %	11.158	3	0. 011
Has the telephone number of a psychologist in the MP contact list	36.0 %	8.6 %	13.714	1	< 0. 001
When going to bed, subject keeps the telephone number of someone they trust in the MP database in case of emergency	14.0 %	10.0 %	0.453	1	0. 501
Subjects feel they are being monitored 24 hrs per day	28.0 %	21.4 %	1.487	1	0. 223
Subjects have the sensation of being accompanied when with an MP	44.0 %	28.6 %	3.052	1	0. 081
Subjects would not have the same freedom of locomotion without an MP	46.0 %	27.1 %	5.336	1	0.021
Subject is afraid of feeling ill in the street and not having an MP on hand in case of emergency	62.0 %	54.3 %	0.710	1	0. 399

Table 3.   Symptoms reported by individuals from Groups 1 and 2 when they are without a mobile phone.

Symptoms	Group 1 Panic Disorder with Agoraphobia	Group 2 Control	χ^2	df	p-value
Anxiety	60.0 %	34.3 %	21.952	1	< 0.001
Trembling	18.0 %	0 %	13.622	1	< 0.001
Perspiration	24.0 %	0 %	18.667	1	< 0.001
Tachycardia	18.0 %	1.4 %	7.408	1	0.006
Respiratory Alterations	24.0 %	4.3 %	10.364	1	0.001
Depression	14.0 %	1.4 %	8.927	1	0.003
Panic	26.0 %	2.9 %	14.282	1	< 0.001
Fear	62.0 %	54.3 %	18.667	1	< 0.001

Table 4.   **Emotions reported by individuals in Groups 1 and 2 in relation to the mobile phone.**

Sensations	Situation	Group 1 PD	Group 2 Control	χ^2	df	p-value
Comfort	When the MP is on hand	96.0 %	85.7 %	3.429	1	0.064
Agitation	When the subject does not have an MP	18.0 %	12.9 %	1.036	1	0.309
Disoriented	When the subject is without an MP	10.0 %	2.9 %	2.709	1	0.100
Dependence	In relation to the MP	68.0 %	65.7 %	0.179	1	0.672
Rejection	When the subject does not receive calls	44.0 %	21.4%	3.154	1	0.076
Low self-esteem	When the subject does not receive calls	18.0 %	1.4 %	10.485	1	0.001
Loneliness	When without an MP	22.0 %	5.7 %	8.881	1	0.003
Insecurity	When without an MP	52.0 %	39.0 %	9.646	5	0.086

All the elements measured in Table **2** differed significantly between the groups. With regard to the results in Table **4**, we only found significant between-group differences for loneliness and self-esteem.

To better understand the relationship between participant-reported symptoms and emotions, we employed the multivariate method of canonical correlation analysis for dichotomous variables.

The canonical discriminant analysis of the participant-reported symptoms provided a single function with an eigenvalue = 0.40 and a canonical correlation = 0.53. The Wilks' lambda value was 0.711 (df = 8, p < 0.001). The results indicated that a single dimension explains the difference between the groups.

In assessing the relative contribution of each variable's linear combination to the standardized canonical discriminant function coefficients, we noted that the order to which the variables contributed was anxiety (0.54), sweating (0.351), panic (0.269), tremors (0.262), depression (0.09) and changes in respiration (0.07). Tachycardia was not significant (0.004). Fear was the only variable that lost statistical weight (-0.18).

In assessing the weight of each variable in the group through the values obtained by the structure matrix, we noted that the order of importance variable for differentiating the groups was anxiety (0.74), sweating (0.67), panic (0.57), tremors (0.56), changes in respiration (0.483), depression (0.44), tachycardia (0.40) and fear (0.12). After examining the functions at the group centroids, we realized that the two groups were discriminated by the symptoms presented with values of 0.74 for patients with PD and -0.53 for controls.

The examination of participant-reported emotions across the groups revealed an eigenvalue of 0.281 with a canonical correlation of 0.47 and a Wilks' lambda of 0.781 (df = 8, p < 0.001). The standardized canonical discriminant function coefficients were 0.53 for loneliness, 0.40 for self-esteem, 0.29 for rejection, 0.36 for disorientation, -0.30 for agitation, -0.09 for dependency and -0.47 for insecurity. The weights of each variable on the structure matrix were 0.58 for self-esteem, 0.54 for rejection, 0.53 for loneliness, 0.36 for comfort, 0.28 for disorientation, 0.18 for agitation, -0.09 for insecurity and -0.07 for dependency.

An evaluation of the functions at the group centroids revealed that the groups were discriminated with regard to these emotions with values of 0.62 and -0.44 for patients with PD and for controls, respectively.

The incidences of sensations such as discomfort, agitation, rejection, disorientation, dependence and insecurity were not significantly different between the groups, indicating that both sets of participants developed similar feelings toward their MPs. This finding illustrates an interaction between people and new technology in which the latter promotes alterations in habits, behaviors and emotions. As such, these interactions should be studied further. As for the significant between-group differences in self-esteem and loneliness, these emotions may be related to personality differences among people. We observed significant differences between the two groups with regard to the incidence of rejection, self-esteem, loneliness and insecurity (Table **4**). Their p-values were 0.076 for Group 1 and 0.086 for Group 2. All participants reported feeling an "emotional emptiness" when they called their friends more than when they received calls or when they did not frequently receive calls. Thus, we consider that this new research on the use of the MP is important.

4. DISCUSSION

Our study found that patients with PDs felt significantly more anxious and depressed with regard to their MP use than did the healthy controls. These symptoms tended to appear in patients with PD when they did not have an MP available or were unable to make a call. The patients also reported greater feelings of rejection, loneliness, insecurity and lower self-esteem when they received few calls on their MPs compared to the feelings experienced by the control group. Verifying these symptoms in patients with PD may be useful for psychological interventions and for examining behavioral changes during treatment [13].

Another interesting finding was that healthy people received and placed more calls with their MPs than patients with PD with agoraphobia (Table **3**).

According to Rangé [14], flight or evasion behaviors can limit the mobility and autonomy of patients with PD and agoraphobia. In this study, patients with agoraphobia fre-

quently reported a fear of feeling ill in public and not having an MP to call for immediate assistance.

Unlike patients with general anxiety disorder (GAD), who complain of constant worry and tension, patients with PD present physical symptoms of panic (i.e., panic attacks) including problems related to the pulmonary, cardiovascular and gastrointestinal systems as well as to their "nerves" [15]. We observed that patients with GAD and those with PD reported increased anxiety, tension and constant worry when they did not have their MP.

We considered their answer to the question regarding their feelings as they describe it (Table **3**). That is, their own description of the subjective suffering could be the best way for us to understand their feelings. The PD patients and the control group complained of many subjective symptoms. Some of them could understand the differences between a panic attack, chronic worry with somatic symptoms (anxiety), and the specific fear of a specific situation (fear) such as being without an MP, but others could not understand the differences. The subjects were, therefore, free to question the research team about their doubts while completing the questionnaire.

Approximately 50% to 70% of the patients with PD have hypochondria [16], whereas only 13% to 17% of patients with hypochondria have PD. Hypochondria and PD are co-morbid when health concerns are not limited to panic attack symptoms [16]. Thus, an MP serves as a security device that may reduce anxiety.

Conversely, dependence associated with nomophobia refers to a disproportionate emotional reaction to the function that the technology serves. For example, just as people can be alcoholics or drug addicts, they can be MP addicts. Thus, "dependence" takes on a pathological component in these cases [17].

The definition of dependence is unclear [16]. Phenomenological dependence is defined as the uncontrollable desire to repeatedly administer a psychoactive substance. Specifically, addicts are no longer able to recognize the negative repercussions of their consumption on their psychological health, family, social life and career. Furthermore, addicts often fail in their efforts to suspend or limit their substance consumption.

In our observation of PD patients with agoraphobia, their misuse of the MP is driven by the desire to escape anxiety. This concept has clear implications for therapy. The concepts of positive and negative reinforcement are always present during PD psychotherapy. There is a difference between seeking social phone contact (positive reinforcement) vs. contacting people by phone as a way to avoid panic or its consequences (negative reinforcement). Compulsion and safety-seeking behavior may be a more appropriate model for the use of the MP by PD patients than is an addiction model.

In this study, 68% of all participants reported some level of dependence on their MPs, which called our attention to numerous aspects that should be investigated and possibly treated, including anxiety disorders.

MP dependence may reveal the presence of a primary disorder, such as dependent personality disorder [18]. This condition is characterized by a fear of abandonment, the self-perception of being weak and incompetent, and difficulty with meeting the demands of daily life. In these patients, dependence on an MP may reveal the need for an agent to facilitate social relationships and communication to increase self-esteem.

As patients with anxious personality disorder [18] may judge whether they are loved and accepted based on the number of calls they receive per day, they may experience additional rejection when they receive fewer calls than other people.

Patients with PD with agoraphobia [19], which is associated with anxiety and recurrent panic attacks, exhibit MP dependence. People with PD fear situations such as having a heart attack, becoming ill in public, or straying far from home. People with PD and MP dependence may attribute their dependence to their need to contact emergency services or people they trust, such as doctors, psychologists or members of their family.

The relationship between rejection sensitivity and a typical depression [1] is highly co-morbid with panic. People with atypical depression or PD may experience difficulties in maintaining relationships, especially due to the fear of rejection. However, in addition to looking at the diagnostic criteria for both cases, we can observe that the feeling of rejection in atypical depression relates more with psychological structuring (insecurity, shyness and low self-esteem) than the feeling of rejection in PD where the individual feels rejected by failing to fully respond to social events.

Nomophobia is also related to the fear of making or receiving a phone call (literally, "telephone fear"). This difficulty is observed in patients with social phobia [18]. Separation anxiety[18] is a disorder in which anxiety is focused on the fear of separation. This fear first appears during infancy. Adult separation anxiety is distinct from its childhood form by its intensity, seriousness, persistence beyond infancy and association with a significant disturbance in social functioning. In these patients, MP dependence may be related to separation anxiety and the need to be accompanied to feel secure. The current study demonstrated that 44% of patients with PD felt accompanied when they possessed an MP and that 46.0% revealed that they would not feel the same freedom of movement without an MP.

These findings illustrate that new technologies [20] alter the habits, behaviors and emotions of the users. As such, the relationship between humans and technology should be further studied [21]. To maintain an accurate profile of modern humans as their habits and behaviors change with technological advancements, additional studies that observe people's physiological and emotional reactions to innovation are necessary. Behavioral changes, whether positive or negative, require constant observation to prevent possible disorders [21]. Furthermore, human interactions with technology should be monitored.

This study has some limitations, including its small sample size and its lack of background literature. Additionally, the fact that the primary instrument's psychometric parameters were not evaluated for its target population presents a limitation. One implication of this limitation is that the in-

strument cannot be portrayed as a measure of the construct called nomophobia. There is no psychometric justification for this. However, the individual items can be used, as was performed in this study, to indicate participant responses to specific questions.

We suggest that additional studies develop specific instruments that have good validity and reliability to assess nomophobia parameters. We recognize that this study should be broadened to effectively operationalize MP use. We did not investigate whether participants' behaviors matched the emotions that they reported related to MP use/deprivation, whether the behaviors were specific to the MP or whether the behaviors are generalized.

Despite having excluded people with psychiatric disorders from the control group, we did not check for any health problems that may have interfered with their relationship to their MP [22, 23].

We found that MPs are an integral part of the popular culture and that the majority of people possess or aspire to possess an MP. We verified that this desire is due to the MPs increased convenience, comfort and security. Unrestricted MP or Internet use is a recent global phenomenon. Although several studies state that these resources have benefits, their use can lead to abuse and to a lack of control, which severely affects the daily lives of users. Thus, we reaffirm the importance of a new study regarding the use of the MP.

5. CONCLUSION

Our study is a novel and creative contribution to the interaction of modern technology with common psychopathology. At the same time, it adds to our knowledge of the clinical phenomenology of PD. The mobile phone may be working as a "phobic partner" for some patients; however, their behavior and specific characteristic make the MP unique, and consequently, the use of the MP deserves a psychopathological description. The questions of our study are not absolutely specific to the relationship between the use of the MP and PD. Some questions may also be related to other mood or anxiety disorders. Further trials and improvements to our questionnaire may promote the quality of future psychopathological studies.

The studies of the relationships between individuals and new technologies are relevant because the new technologies produce behavioral changes as well as feelings and symptoms that should be studied and monitored continuously in a modern society.

The relationship of the MP in patients with PD shows that the behavior of the patient is proportional to the level of insecurity and fear. Patients with PD report that when they have the MP in their hands, they feel as if they are not alone, that is, they have a feeling of being accompanied.

We do not intend to manage the use of the MP use in treatment or wean patients from the apparatus. Everyone is free to make use of the technologies available when they want it. As we have observed in this study, the MP brought comfort and safety to both groups. With respect to PD, the medical and psychological treatments should be directed to and should focus on the main symptoms. The extent to which the patient progresses in treatment, therefore, will be

evidenced by his/her ability to abandon the pathological dependence on the MP and the reduction in other behaviors related to PD.

CONFLICT OF INTEREST

The author(s) confirm that this article content has no conflicts of interest.

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